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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/028,108	12/20/2001	Ching-Pang Lee	13DV14203	3092

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EXAMINER

MCNEIL, JENNIFER C.

ART UNIT	PAPER NUMBER
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1775

DATE MAILED: 04/02/2003

7

Please find below and/or attached an Office communication concerning this application or proceeding.

mk-7

Office Action Summary

Application No.

10/028,108

Applicant(s)

LEE ET AL.

Examiner

Jennifer McNeil

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 February 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 December 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>2, 5</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

The restriction requirement is withdrawn in light of applicant's comments submitted February 5, 2003.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-6, 9, 12-17, 19, and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Gupta et al (US 5,941,686). Gupta teaches a turbine engine component, such as a blade or vane, with cooling passages (pores). The cooling passages extend from a first opening in a first wall surface to a second opening in a second wall surface. Deposited on the second wall surface is a protective coating (22), some of which is deposited within the passage through the second opening. The coating may be a thermal barrier coating (col. 3, lines 22-47).

Regarding claims 4 and 14, a bond coat may be provided prior to the coating of the TBC (col. 5, lines 40-45). The bond coat may be an aluminide.

Regarding claims 5 and 6, the deposition includes the passages (col. 5, lines 51-56).

Regarding claim 9, as shown in Figure 3, the orientation of the passages may be perpendicular to the wall surface.

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Regarding claims 12 and 13, there may be two types of passages in the wall. One set of passages has a diameter in the range of 0.01-0.03 inches, and the other passages have a range of about 0.02-0.04 inches. Therefore, one set of passages may be smaller than the other set (col. 5, lines 1-7).

Regarding claim 15, the thermal barrier coating is yttria-stabilized zirconia (col. 5, lines 43-45)

Regarding claims 16, 17, 19, and 20, the turbine component may be a vane, a blade, a combustor, or a shroud (col. 1, lines 15-22).

Claims 1-3 are rejected under 35 U.S.C. 102(e) as being anticipated by Caldwell et al (US 6,408,610). Caldwell teaches a turbine component with cooling holes. A layer of thermal barrier coating material is deposited on the substrate and the interior surfaces of the cooling holes (col. 3, lines 5-17).

Regarding claim 2, the holes extend from an exterior surface to an interior surface of the component.

Regarding claim 3, there is no teaching of a bond coat.

Claims 1-6, 9, and 14-20 are rejected under 35 U.S.C. 102(e) as being anticipated by Lee et al (US 6,511,762). Lee teaches a cooling system for a turbine engine component including a plurality of channels (pores)(6) extending from one surface to a second surface. A thermal barrier coating (16) is deposited onto the component and covers the channels.

Regarding claim 3, a bond coat is optional.

Regarding claims 4-6, a bond coat (14) is deposited prior to application of the thermal barrier coating. As shown in Figure 2, the bond coating extends into and lines the channels.

Regarding claim 9, as shown in the figures, the channels are perpendicular to the surface of the component.

Regarding claim 14, the bond coat may be an aluminide.

Regarding claim 15, the thermal barrier coating is YSZ.

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Regarding claims 16-20, the component may be a combustor, a vane, a blade, a nozzle, or a shroud (col. 5, lines 38-43).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 10, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gupta et al (US 5,941,686). Gupta teaches a turbine engine component, such as a blade or vane, with cooling passages (pores) as discussed above. Gupta does not specifically teach a pitch-to-diameter ratio of the passages. Gupta teaches the formation of a plurality of passages in the component, and it is the position of the examiner that absent a showing of unexpected results, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the cooling passages in an amount and spacing which provides for optimal cooling of the component.

Regarding claim 11, the cooling passages may have a diameter of about 0.01, or 254 microns.

Claims 7, 8, 10, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al (US 6,511,762). As discussed above, Lee teaches a cooling system for a turbine engine component including a plurality of channels (pores)(6) extending from one surface to a second surface, and a thermal barrier coating (16) deposited onto the component and covering the channels. Lee does not specifically teach fully lining the channels with the bond coat, or a pitch-to-diameter ratio. Regarding claims 7 and 8, it is the examiner's position that it would have been obvious to one of ordinary skill in the art at the time of the invention to fully line the channels of Lee to provide a bond coating that will improve adherence of

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the thermal barrier coating to the substrate. Regarding claims 10 and 11, it is the position of the examiner that absent a showing of unexpected results, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the cooling passages in an amount and spacing which provides for optimal cooling of the component.

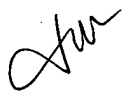
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer McNeil whose telephone number is 703-305-0553. The examiner can normally be reached on Monday through Friday, 9:30AM-6:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Deborah Jones can be reached on 703-308-3822. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Jennifer McNeil
Examiner
Art Unit 1775



JCM
April 1, 2003